

WHAT IS CLAIMED IS:

1 1. A portable electronic device with power failure  
2 recovery, powered by a main power source, comprising:  
3 a power detection module, detecting an output  
4 characteristic from the main power source, for asserting  
5 an interrupt signal if the detected output characteristic  
6 is below a first threshold value;  
7 a processor, responsive to the interrupt signal, for  
8 asserting a turn-off signal and an enable signal;  
9 a timing unit, responsive to the enable signal, for  
10 asserting a notification signal at a predetermined time  
11 interval when the enable signal is asserted, wherein the  
12 timing unit is directly powered by a backup power source;  
13 and  
14 a power management unit, electrically coupled to the  
15 main power source and the backup power source, for  
16 disconnecting the main power source to a circuit block  
17 with high power consumption when the turn-off signal is  
18 asserted, and for reconnecting the main power source to  
19 the circuit block with high power consumption when the  
20 notification signal is asserted and the output  
21 characteristic of the main power source is beyond a  
22 second threshold value.

1 2. The portable electronic device as recited in claim 1  
2 further comprising a volatile RAM powered by the backup  
3 power source, wherein the volatile memory stores  
4 operation data when the power failure in the main power  
5 source occurs.

1       3. The portable electronic device as recited in claim 2  
2 wherein the processor performs a resume operation based  
3 on the operation data stored in the volatile memory when  
4 the main power source is reconnected by the power  
5 management unit.

1       4. The portable electronic device as recited in claim 1  
2 wherein the timing unit further includes a clock for  
3 keeping track of ongoing time and date.

1       5. The portable electronic device as recited in claim 1  
2 wherein the backup power source is charged by the main  
3 power source when the output characteristic of the main  
4 power source is beyond the second threshold value.

1       6. The portable electronic device as recited in claim 1  
2 wherein the backup power source is charged by the power  
3 management unit when the output characteristic of the  
4 main power source is beyond the second threshold value.

1       7. The portable electronic device as recited in claim 1  
2 wherein the main power source is a removable battery.

1       8. The portable electronic device as recited in claim 1  
2 wherein the backup power source is a built-in battery.

1       9. The portable electronic device as recited in claim 1  
2 wherein the backup power source is a large charged  
3 capacitor.

1       10. The portable electronic device as recited in claim  
2       1 wherein the first threshold value and the second  
3       threshold value are the same.

1       11. The portable electronic device as recited in claim  
2       1 wherein the circuit block with high power consumption  
3       includes the processor, a radio part and at least an  
4       input/output device.

1       12. The portable electronic device as recited in claim  
2       3 wherein the volatile RAM is a static RAM with low power  
3       consumption.

1       13. A portable electronic device with power failure  
2       recovery, powered by a main power source, comprising:  
3       a power detection module, detecting an output  
4       characteristic from the main power source, for asserting  
5       an interrupt signal when a power failure in the main  
6       power source occurs and the detected output  
7       characteristic is below a first threshold value;  
8       a volatile RAM, for storing operation data when the  
9       power failure in the main power source occurs;  
10      a processor, responsive to the interrupt signal, for  
11      asserting a turn-off signal and an enable signal;  
12      a timing unit, responsive to the enable signal, for  
13      asserting a notification signal at a predetermined time  
14      interval when the enable signal is asserted; and  
15      a power management unit, electrically coupled to the  
16      main power source and a backup power source, power  
17      supplying the timing unit and the volatile RAM from the  
18      backup power source, for disconnecting the main power

19 source to a circuit block with high power consumption  
20 when the turn-off signal is asserted, and for  
21 reconnecting the main power source to the circuit block  
22 with high power consumption when the notification signal  
23 is asserted and the output characteristic of the main  
24 power source is beyond a second threshold value;

25 wherein the processor performs a resume operation based  
26 on the operation data stored in the volatile memory when  
27 the main power source is reconnected.

1 14. The portable electronic device as recited in claim  
2 13 wherein the timing unit further includes a clock for  
3 keeping track of ongoing time and date.

1 15. The portable electronic device as recited in claim  
2 13 wherein the backup power source is charged by the main  
3 power source when the output characteristic of the main  
4 power source is beyond the second threshold value.

1 16. The portable electronic device as recited in claim  
2 13 wherein the backup power source is charged by the  
3 power management unit when the output characteristic of  
4 the main power source is beyond the second threshold  
5 value.

1 17. The portable electronic device as recited in claim  
2 13 wherein the first threshold value and the second  
3 threshold value are the same.

1 18. The portable electronic device as recited in claim  
2 13 wherein the circuit block with high power consumption

3 includes the processor, a radio part and at least an  
4 input/output device.

1 19. The portable electronic device as recited in claim  
2 13 wherein the volatile RAM is a static RAM with low  
3 power consumption.

1 20. A method for a portable electronic device  
2 recovering from a power failure in a main power source,  
3 the method comprising:

4 detecting a output characteristic of the main power  
5 source;

6 disconnecting the main power source to a circuit block  
7 with high power consumption when the detected output  
8 characteristic is below a first threshold value;

9 detecting the output characteristic of the main power  
10 source in response to a notification signal asserted from  
11 a timing unit at a predetermined time interval; and

12 reconnecting the main power source to the circuit block  
13 with high power consumption when the detected output  
14 characteristic is beyond a second threshold value.